63. (Cancelled)

64. (Previously Presented) The manifold layer according to claim 61 wherein the inlet and outlet passages are arranged in a uniform manner along at least one dimension.

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65. (Withdrawn) The manifold layer according to claim ~~63~~ wherein the inlet and outlet passages are arranged in a non-uniform manner along at least one dimension of the third layer.

66. (Previously Presented) The manifold layer according to claim 61 wherein the inlet and outlet apertures are separately sealed from one another.

67. (Previously Presented) The manifold layer according to claim 61 wherein at least one of the inlet passages has an inlet dimension substantially equivalent to an outlet dimension of at least one outlet passage.

68. (Previously Presented) The manifold layer according to claim 61 wherein at least one of the inlet passages has an inlet dimension than an outlet dimension of at least one outlet passage.

69. (Currently Amended) A method of manufacturing a heat exchanger configured to cool a heat source, the method comprising the steps of:

a. forming an interface layer configurable to be in contact with the heat source to pass fluid therethrough, wherein the interface layer includes a micro-porous microstructure disposed thereon;

b. forming a manifold layer to include at least one inlet fluid path and at least one outlet fluid path, the at least one inlet fluid path and the at least one outlet fluid path arranged to channel fluid flow an optimal minimum distance therebetween along the interface layer; and

c. coupling the manifold layer to the interface layer.

48. (Original) The heat exchanger according to claim 37 wherein at least one of the first apertures has an inlet dimension different than an outlet dimension of at least one of the second apertures in the plurality.

49. (Original) The heat exchanger according to claim 33 wherein the interface layer is made of a material having a thermal conductivity of at least 100 W/mk.

50. (Original) The heat exchanger according to claim 33 wherein the interface layer further comprises a plurality of pillars disposed thereon in an appropriate pattern.

51. (Original) The heat exchanger according to claim 50 wherein at least one of the plurality of pillars includes at least varying dimension along a predetermined direction.

52. (Original) The heat exchanger according to claim 50 wherein an appropriate number of pillars are disposed in a predetermined area along the interface layer.

53. (Original) The heat exchanger according to claim 33 wherein at least a portion of the interface layer has a roughened surface.

54. (Original) The heat exchanger according to claim 50 wherein the plurality of pillars include a coating thereupon, wherein the coating has an appropriate thermal conductivity of at least 10 W/m-K.

55. (Canceled)

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56. (Original) The heat exchanger according to claim ~~55~~ 33 wherein the porous microstructure includes at least one pore having a varying dimension along a predetermined direction.

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57. (Original) The heat exchanger according to claim ~~55~~ 33 wherein an average pore size in the porous microstructure is within the range and including 30 microns and 300 microns.

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58. (Original) The heat exchanger according to claim ~~55~~ 33 wherein at least one region of the

22. (Original) The heat exchanger according to claim 1 wherein the interface layer further comprises a plurality of pillars configured in a predetermined pattern along the interface layer.

23. (Original) The heat exchanger according to claim 22 wherein at least one of the plurality of pillars includes at least varying dimension along a predetermined direction.

24. (Original) The heat exchanger according to claim 22 wherein an appropriate number of pillars are disposed in a predetermined area along the interface layer.

25. (Original) The heat exchanger according to claim 1 wherein at least a portion of the interface layer has a roughened surface.

26. (Original) The heat exchanger according to claim 22 wherein the plurality of pillars include a coating thereupon, wherein the coating has an appropriate thermal conductivity of at least 10 W/m-K.

27. (Canceled)

28. (Original) The heat exchanger according to claim ~~27~~ 1 wherein the porous microstructure includes at least one pore having a varying dimension along a predetermined direction.

29. (Original) The heat exchanger according to claim 1 further comprising a plurality of microchannels disposed in a predetermined configuration along the interface layer.

30. (Original) The heat exchanger according to claim 1 wherein the interface layer is coupled to the heat source.

31. (Original) The heat exchanger according to claim 1 wherein the interface layer is integrally formed to the heat source.

32. (Original) The heat exchanger according to claim 1 wherein the heat source is an